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August 25, 1992

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Document Processing Center (TS-790)
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
401 M Street, S. W.
Washington, DC 20460

Attn: TSCA Section 8(e) Coordinator (CAP Agreement)

Re: EPA ID No. 8ECAP-0009

Dear Sir or Madam:

BP Oil, Inc. submits the attached study pursuant to the terms of the TSCA Section 8(e) Compliance Audit Program (CAP) and the BP America CAP Agreement:

Study Identification

A 48-Hour Aquatic Toxicity Study of 70 Orchard Spray; Laboratory Project No. 82-069; Final Report dated May 26, 1983 and Amendment No. 1 dated March 7, 1984.

BP Oil acquired this information from another company in 1985 as part of a corporate transaction.

Identity of Tested Chemical Substance/Mixture and CAS Number (if known)

Distillates, petroleum, hydrotreated light paraffinic

CAS Number: 64742-55-8

Summary of Reportable Information

The objective of this study was to determine the median concentration (EC50) of 70 Orchard Spray that produced D. magna immobilization or death during a 48-hour exposure.

The 48-hour EC50 for 70 Orchard Spray was calculated to be 2.2 mg/l. This value assumes the test material to be completed soluble in water and that it

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remains solubilized during the 48-hour exposure period. Actual water concentrations of the test material conponents were not determined.

Previous PMN or 8(e) Submissions by BPA: EPA Document Control Number(s)

None

Changes in business strategy resulted in 70 Orchard Spray being dropped from BP Oil's product line in 1988.

Please direct any questions about this submission to BP America's Manager of Toxicology, Mr. Dale E. Strother, at 216-586-8262.

Sincerely,

Dennis R. Jonke
Manager, Health, Safety and
Environmental Quality
BP Oil, Inc.

Gulf Life Sciences Center
260 Kappa Drive
Pittsburgh, PA 15238-2874

REPORT

48-HOUR AQUATIC TOXICITY STUDY IN DAPHNIA WITH 70 ORCHARD SPRAY

PROJECT #82-069

1.0 SPONSOR: Gulf Oil Refining and Marketing Company
P.O. Box 2001, Houston, TX 77252

2.0 SPONSOR REPRESENTATIVE: John H. Butala, M.S.
Medical and Health Resources Division
Gulf Oil Corporation

3.0 STUDY DATES:

3.1 Initiation: August 16, 1982

3.2 Completion: September 5, 1982

3.3 Reported: May 26, 1983

4.0 OBJECTIVE:

To determine the 48-hour median effective concentration (48-hour EC50) of a test substance in terms of test animal immobilization or death.

5.0 CONCLUSION:

The 48-hour EC50 was 2.2-mg/l nominal concentration of 70 Orchard Spray. The maximum saturated test concentration achievable in water under the conditions of this study could not be determined. The results of the hexavalent chromium positive control study indicated all test parameters were within acceptable limits.

6.0 SIGNED: Linda S. Glenn
Linda S. Glenn, B.S.
Toxicologist

Gary A. Rausina
Gary A. Rausina, M.S.
Study Director/Section Head
Acute and Environmental
Toxicology

* * * * *

All raw data, required specimens, and the final report for this study are archived at the testing facility.

7.0 TEST AND CONTROL SUBSTANCES:

7.1 Test Substance:

7.1.1 Name: 70 Orchard Spray

7.1.2 Life Sciences Center Code No.: T-107 (MM-211)

7.1.3 CAS No.: 64742-55-8

7.1.4 Physical Description: Clear, colorless liquid. The results of the analytical characterization of the test substance are available in the testing facility archives.

7.1.5 Stability: Stability testing was not performed. This information may be requested from the sponsor.

7.1.6 Purity: Purity information may be requested from the sponsor.

7.2 Control Substance:

7.2.1 Name: Potassium Dichromate (Hexavalent Chromium)

7.2.2 Life Sciences Center Code No.: C-17

7.2.3 CAS No.: 7778-50-9

7.2.4 Physical Description: Reddish, orange crystals

7.2.5 Stability: The stability of the laboratory-grade positive control substance was not determined.

7.2.6 Purity: 99.98%

8.0 TEST SYSTEM:

8.1 Test Animal: Daphnia, Daphnia magna

8.2 Source: Sea Plantations, Inc.
29 Congress Street
Salem, MA 01970

8.3 Date Animals Received: April 23, 1982

8.4 Procedure for Identification of Species: The animals were identified by the supplier. They were also identified as Daphnia magna, Straus, by our laboratory staff using a taxonomic key for cladocera that is found in Pennak.[1]

8.5 Maintenance:

8.5.1 The daphnia used in the study were derived from a clone of animals. A clone is a culture of organisms that are genetically identical having been parthenogenetically produced from a single organism.

8.5.2 For the study, approximately 20 gravid daphnia, with large numbers of ripe offspring in their brood chambers, were pipetted from a culture vessel and introduced into a vessel containing 2 liters of aged charcoal-filtered municipal water. The young of these animals, when approximately 24 hours old (first instar), were used as test animals.

8.5.3 A suspension of daphnia food was added to the water in the vessel at a concentration of 1 ml food suspension per liter of water.

8.5.3.1 Diet Used: Daphnia Chow

8.5.3.2 Formula of Diet: A suspension of 10 g Purina Certified Trout Chow #2 and 0.5 g alfalfa blended in 300 ml of water and strained through nylon mesh.

8.5.4 Water Source:

8.5.4.1 All acclimation and test vessels contained charcoal-filtered municipal water.

8.5.4.2 The range in mean hydrogen ion concentrations of the test water throughout the study was 8.2 to 8.6 pH.

8.5.4.3 The range in mean water temperatures throughout the study was 20.0 to 21.3°C.

8.5.5 The animals were exposed to a daily photoperiod of 12 hours continuous light and 12 hours continuous darkness.

8.5.6 Test Apparatus: The study was conducted in a flow-through proportional diluter system in which specific amounts of test material (test substance or positive control substance) were dispensed into the test vessels at regular time intervals. The test concentrations were produced by diluting the high test concentration with volumes of control water. A diagram of the flowthrough system is presented in Appendix 2a.

8.6 Assignment to Study:

8.6.1 Placement of Test Animals into the Bioassay Vessels: Starting at one end of the bioassay table, 2 animals were placed into each vessel proceeding from one vessel to the next in consecutive order until all vessels contained 2 daphnia. Then, proceeding in the reverse direction, 2 more animals were added to each vessel. This method was repeated until all 10 animals were placed in each vessel.

8.6.2 Randomization of Bioassay Vessels: Each bioassay vessel on the table was assigned to a test concentration using computer-generated random numbers.

9.0 EXPERIMENTAL DESIGN:

9.1 Dose Levels: The following concentrations were tested in the definitive study after a range-finding test was completed. Results of the range-finding test are presented in the raw data.

Test Material	Nominal Concentration (mg/l) [a]	Number of Animals Per Test Level	Number of Bioassay Vessels Per Test Level [b]
Untreated Control 1	None	20	2
Untreated Control 2	None	20	2
70 Orchard Spray (Test Substance)	1.0	20	2
	1.8	20	2
	3.2	20	2
	5.6	20	2
	10.0	20	2
Hexavalent Chromium (Positive Control Substance)	0.10	20	2
	0.18	20	2
	0.32	20	2
	0.56	20	2
	1.00	20	2

Note: Untreated Control 1 was tested with the test substance and Untreated Control 2 was tested with the positive control substance.

[a] The nominal concentration is the calculated amount of test material that is required to achieve the desired test level. This value assumes the test material is completely soluble in water and that it remains in the water at a stable concentration during the time the animals are exposed.

[b] Each bioassay vessel contained 10 daphnia.

9.2 Stock Solution Preparation:

9.2.1 Test Substance: Each day a 100-mg/l nominal test concentration of 70 Orchard Spray was prepared by vigorously mixing 1.70 ml of test substance into 14.4 l of water. The stock solution was continuously stirred while it was dispensed into the flow-through proportional diluter system. Dilutions of the stock solution were produced in the proportional diluter system in order to achieve the desired test concentrations.

9.2.2 Positive Control Substance: Each day a 10-mg/l nominal test concentration of hexavalent chromium was prepared by vigorously mixing 407.5 mg of potassium dichromate into 14.4 l of water. The stock solution was continuously stirred while it was dispensed into the flowthrough proportional diluter system. Dilutions of the stock solution were produced in the proportional diluter system to achieve the desired test concentrations.

9.3 A peristaltic pump dispensed approximately 25 ml of the stock solution into the flowthrough system during each 2.5 minutes/cycle. At this flowrate, 14.4 l of the preparation was dispensed into the system every 24 hours.

9.4 The flowthrough system was calibrated to deliver 100 ml of test water to each test level every 2.5 minutes/cycle. Thus, approximately 50 ml of test water flowed into each duplicate of each test level. Since the capacity of each test vessel was approximately 3.0 l, the turnover rate (the number of times a vessel was filled in 24 hours) was 9.6 tank changes per day.

9.5 In each bioassay vessel, the test animals were placed into a floating polypropylene container that had a mesh bottom in it. The mesh allowed water to pass into the container but kept the daphnia from escaping. Use of the 8 cm x 8 cm cylindrical container resulted in easier observation of the test animals and kept them from being accidentally discharged at the overflow standpipe.

10.0 OBSERVATIONS:

10.1 Daily records were kept for the number of immobilized and dead animals that were found in each test vessel. The observation intervals were 6, 24, and 48 hours. A 1-hour observation interval was not attempted in the bioassay. The Study Director considered an attempt to do so would have resulted in an unnecessary disturbance of the test animals that may have significantly altered the study results.

10.1.1 Since the animals were not tagged, a numerical value indicating the number found immobilized or dead versus the total number of animals exposed was recorded.

10.1.2 The results from each duplicate vessel as well as the composite data for the test levels were tabulated.

10.2 Statistical Analysis of Mortality Data: A statistical analysis of the data was conducted when a precise EC50 investigation was necessary.

10.2.1 At the end of the study, the dose-response results between 10 and 90% at 24 and 48 hours were analyzed to permit calculations of the EC50 using the method of Litchfield and Wilcoxon.[2] An EC50 was calculated for each set of duplicates as well as the composite data from the test concentrations.

10.2.2 A Chi-square test was performed on each dose-response curve in order to insure the data was nonheterogeneous and the dose-response curve was a good fit. This substantiates the validity of the EC50 calculation.

10.3 After completion of the study, the calculated 48-hour EC50 values of the test and positive control substances were used to classify their potential for acute environmental hazard. The Gulf Toxicology Department's Classification Scheme for Acute Environmental Hazard Assessment is presented in Appendix 2b.

10.4 Water temperature, dissolved oxygen concentration, and pH were measured and recorded daily in each bioassay vessel.

10.5 Total alkalinity, total hardness, and specific conductance were measured and recorded during the first 6 hours and again at 48 hours in each bioassay vessel.

10.6 Water samples were taken on Day 0 and at 48 hours from each bioassay vessel for chemical analysis to determine the actual concentrations of test or positive control substance that were present in the water.

10.7 Analytical Methods Used for Detection of Test/Positive Control Substances:

10.7.1 Test Substance: Chemical analysis to confirm the actual concentration of 70 Orchard Spray in each test level was determined with a fluorescence spectrophotometer. The instrument was set for an excitation wavelength of 410 nm (bandwidth 10 nm) and an emission wavelength of 440 nm (bandwidth 20 nm). When suitable calibration standards could not be prepared, the actual concentration of test substance in the water of each test level was not determined.

10.7.2 Positive Control Substance: Hexavalent chromium, in the form of potassium dichromate, was detected in the water samples by atomic absorption. The instrument's detection range was set at a wavelength of 357.5 nm (slit width 0.7 nm) and an air/acetylene flame was used. The instrument was calibrated at 0.1, 0.3, 0.7, and 1.0 mg/l.

10.8 Daily flowthrough system calibration and examination records were kept.

11.0 RESULTS:

11.1 Dose-response curves were established for both the test substance and positive control. The test results as well as the 24- and 48-hour EC50 calculations and Chi-square test results for each curve are presented in Appendices 3a through 3j.

The results of the calculations are as follows:

70 Orchard Spray

24-Hour EC50 = 2.9 mg/l
95% Confidence Limits = 1.9 - 4.4 mg/l

48-Hour EC50 = 2.2 mg/l
95% Confidence Limits = 1.6 - 2.7 mg/l

Hexavalent Chromium

24-Hour EC50 = 0.80 mg/l
95% Confidence Limits = 0.68 - 0.94 mg/l

48-Hour EC50 = 0.23 mg/l
95% Confidence Limits = 0.19 - 0.27 mg/l

In both the test substance and positive control studies, the dose-response data for the duplicates were relatively similar. These results are found in the raw data.

The results from the study for the positive control substance conforms with data found in the literature (EPA Water Quality Criteria Data Book) pertaining to the acute toxic responses of freshwater invertebrates that were exposed to hexavalent chromium.[3] The results, therefore, confirm that all test parameters, i.e., health of organisms, water quality, etc., were within acceptable limits.

11.2 Usually, the study results are applied to the Gulf Toxicology Department's Acute Hazard Classification Scheme for Environmental Testing (Appendix 2b). However, because the actual water-soluble concentrations of 70 Orchard Spray were not determined, this rating scheme was not used for the test substance. The hexavalent chromium positive control is considered to be Highly Toxic to daphnia since its 48-hour EC50 is less than 1 mg/l.

11.3 Mean water-characteristic measurements that were recorded in each test level are presented in Appendices 4a and 4b.

There were no dose-response changes in any of the water-characteristic measurements that were determined throughout the 70 Orchard Spray and positive control studies.

11.4 Analytical Chemistry Results:

The analytical chemistry results for the actual test concentrations of 70 Orchard Spray and positive control substance found in the test water are presented in Appendix 5.

11.4.1 Test Substance: Chemical analysis of the water in each test level could not be performed.

11.4.2 Positive Control Substance: The analysis of the hexavalent chromium positive control test water indicated that the nominal concentrations of this substance were achieved in the flowthrough proportional diluter system.

11.5 Daily Flowthrough System Calibration/Examination Observations: Daily flowthrough system calibration/examination records are found in the raw data.

11.5.1 Test Substance: Calibrated test water volumes remained relatively constant throughout the study. The flowthrough system's cycle speed was relatively constant. The system provided 98.6% of the cycles that it was calibrated to achieve during the study.

11.5.2 Positive Control Substance: Calibrated test water volumes remained relatively constant throughout the study. The flowthrough system's cycle speed was relatively constant. The system provided 103% of the cycles that it was calibrated to achieve.

12.0 STUDY PERSONNEL:

The following supervisory personnel were involved in the conduct of this study:

12.1 Study Director: Gary A. Rausina, M.S.

12.2 Study Monitor: Linda S. Glenn, B.S.

12.3 Other Personnel: David S. Boyer, B.S.

13.0 REFERENCES:

[1]PENNAK, R. W. (1978). Freshwater Invertebrates of the United States. 2nd Ed. John Wiley & Sons. New York.

[2]LITCHFIELD, J. T., and WILCOXON, F. (1949). A Simplified Method of Evaluating Dose-Effect Experiments. J. Pharmacol. Exp. Ther. 96, 99-113.

[3]UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (1971). Effects of Chemical on Aquatic Life. Water Quality Criteria Data Book. Vol 3. U.S. Gov. Printing Office, Washington, DC 20402.

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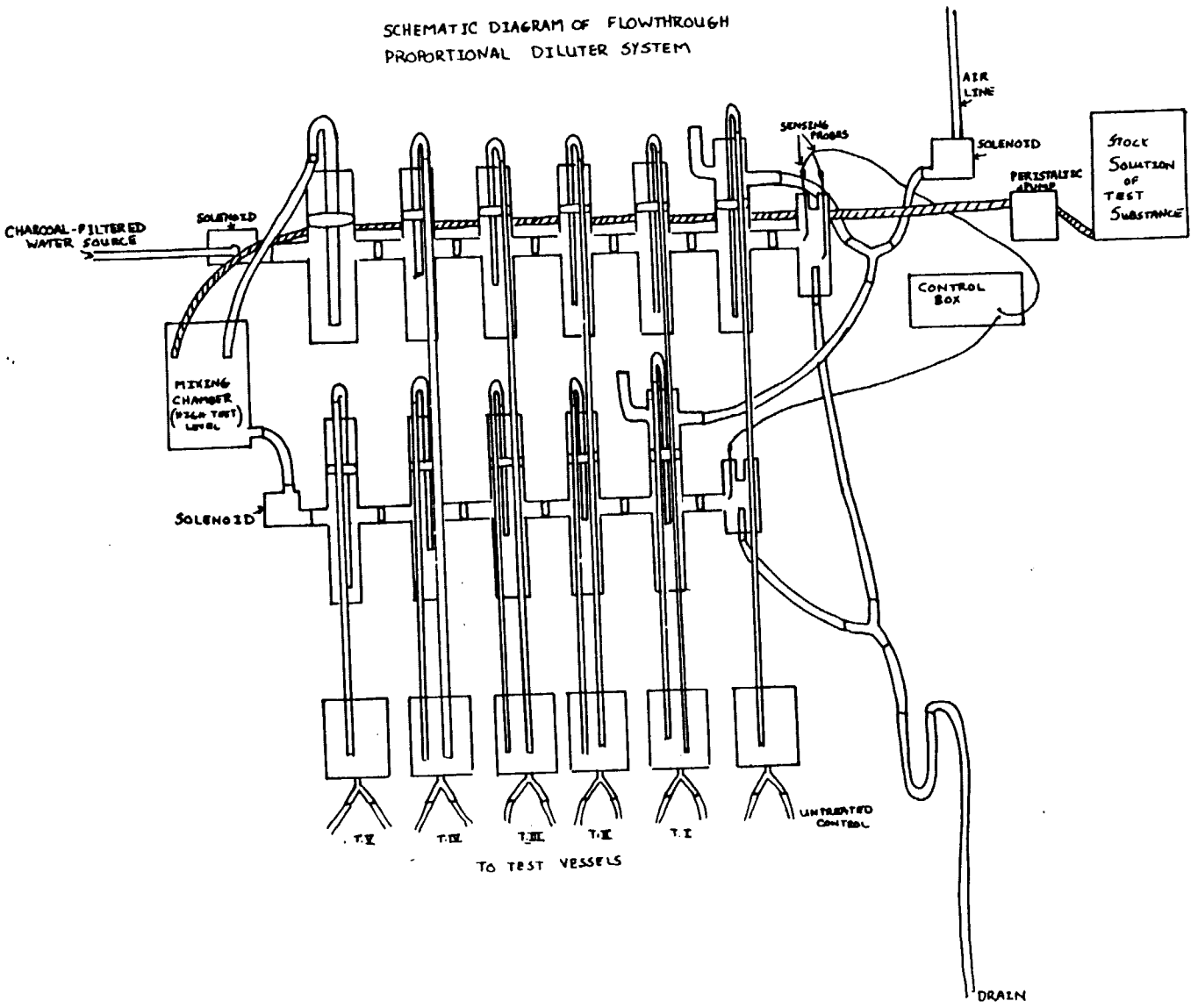
APPENDIX 1

PROTOCOL AMENDMENTS

All protocol amendments are incorporated in the body of the report.

Appendix 2a
Project #82-069



APPENDIX 2b

GULF TOXICOLOGY DEPARTMENT

ACUTE HAZARD CLASSIFICATION SCHEME FOR ENVIRONMENTAL TESTING

Rating Scale	Test Concentration EC50 or LC50*	Acute Hazard Classification
0	$\geq$ 100 mg/l	Practically Nontoxic
1	10 < 100 mg/l	Slightly Toxic
2	1 < 10 mg/l	Moderately Toxic
3	<1 mg/l	Highly Toxic

*The time intervals that are applied to the classification scheme in each acute study are listed below.

48-Hour EC50 in the Acute Daphnia Study
96-Hour EC50 in the Acute Algal Study
96-Hour LC50 in the Acute Fish and Mysid Shrimp Studies

APPENDIX 3a

48-HOUR AQUATIC TOXICITY STUDY IN DAPHNIA

Tabulation of the Number of Affected* Animals Found in Each Test Level

Test Substance	Nominal Test Concentration** (mg/l)	Duplicate	Cumulative Number of Affected* Animals at the Following Observation Intervals: 6-Hr	24-Hr	48-Hr	Dose Level Totals: Number Affected* / Number Tested	Percent Affected
Untreated Control	None	1	0	0	1		
		2	0	0	0	1/20	5%
70 Orchard Spray	1.0	1	0	2	3		
		2	1	2	2	5/20	25%
	1.8	1	0	1	5		
		2	1	2	2	7/20	35%
	3.2	1	3	7	8		
		2	5	6	6	14/20	70%
	5.6	1	2	9	9		
		2	6	9	9	18/20	90%
	10.0	1	6	10	10		
		2	7	9	10	20/20	100%

* Affected animals are daphnia that are either immobilized or dead.

**The nominal concentration is a theoretical amount of test substance required to achieve the desired test volume. This value assumes complete solubility of the test substance.

Appendix 3b

CALCULATION SHEET FOR LITCHFIELD-WILCOXON EC_{50} DETERMINATION

Test Substance: 70 Orchard Spray Study Number: 82-069

Test Title: 48 hour Toxicity Study (24 Hour Composite) Species: Daphnia magna

Observed and Expected Percent-Affected Table

Dose Level (mg/l)	Number of Organisms	Number of Affected Organisms	Observed Percent-Affected Organisms	Expected Percent-Affected Observed	Observed Minus Expected	Chi^2
1.0	20	2	10	5.7	4.3	0.0325
1.8	20	3	15	22	7	0.0275
3.2	20	13	65	56	9	0.0300
5.6	20	18	90	835	65	0.0290
10.0	20	19	95	96.5	15	0.0055
						0.1245

NOTE: The numbers in parenthesis are corrected values for 0 and 100 percent affected dose levels.

Calculation of Chi^2

K = 5 Total # of Organisms tested: 100 Ave. # Organisms/Level: 20

Calculated Chi^2 = Total Chi^2 from Table times Average # of Organisms/Dose Level

= 20 x 0.1245 = 2.49

Degrees of Freedom (N) = K-2 = 3

From Table 2, the Chi^2 for N degrees of freedom = 7.82

If the calculated Chi^2 is less than the tabular Chi^2 the line is a good fit.

Calculation of the 95% Confidence Limits of the EC_{50}

$$S = \frac{EC_{84}/EC_{50} + EC_{50}/EC_{16}}{2} = 1.95$$

N' = 20

Exponent = $2.77/\sqrt{N'}$ = 0.62

$fEC_{50} = S^{(Exponent)}$ = 1.51

Upper Limit = $(EC_{50}) \times (fEC_{50})$ = 4.38 mg/l

Lower Limit = $(EC_{50}) / (fEC_{50})$ = 1.92 mg/l

Form # 07.0009 (7/82)

Appendix 3c

Project # 82-069

Species: Daphnia

Level (mg/l) of 70 Orchard Spray

46 8040

Percent Affected

24-Hour EC50 = 2.9 mg/l

95% Confidence Limits

CALCULATION SHEET FOR LITCHFIELD-WILCOXON EC_{50} DETERMINATION

Test Substance: 70 Orchard Spray Study Number: 82-069

Test Title: 48 hour Toxicity Study (48 HOUR COMPOSITE) Species: Daphnia magna

Observed and Expected Percent-Affected Table

Dose Level (mg/l)	Number of Organisms	Number of Affected Organisms	Observed Percent-Affected Organisms	Expected Percent-Affected Observed	Observed Minus Expected	Chi^2
1.0	20	5	25	15	10	0.055
1.8	20	7	35	43	8	0.025
3.2	20	14	70	71	1	0
5.6	20	18	90	91	1	0.001
10.0	20	20	100(99.1)	98.2	0.9	0.0045
						0.0855

NOTE: The numbers in parenthesis are corrected values for 0 and 100 percent affected dose levels.

Calculation of Chi^2

K = 5 Total # of Organisms tested: 100 Ave. # Organisms/Level: 20

Calculated Chi^2 = Total Chi^2 from Table times Average # of Organisms/Dose Level

= 20 x 0.0855 = 1.71

Degrees of Freedom (N) = K-2 = 3

From Table 2, the Chi^2 for N degrees of freedom = 7.82

If the calculated Chi^2 is less than the tabular Chi^2 the line is a good fit.

Calculation of the 95% Confidence Limits of the EC_{50}

$$S = \frac{EC_{84}/EC_{50} + EC_{50}/EC_{16}}{2} = 2.08$$

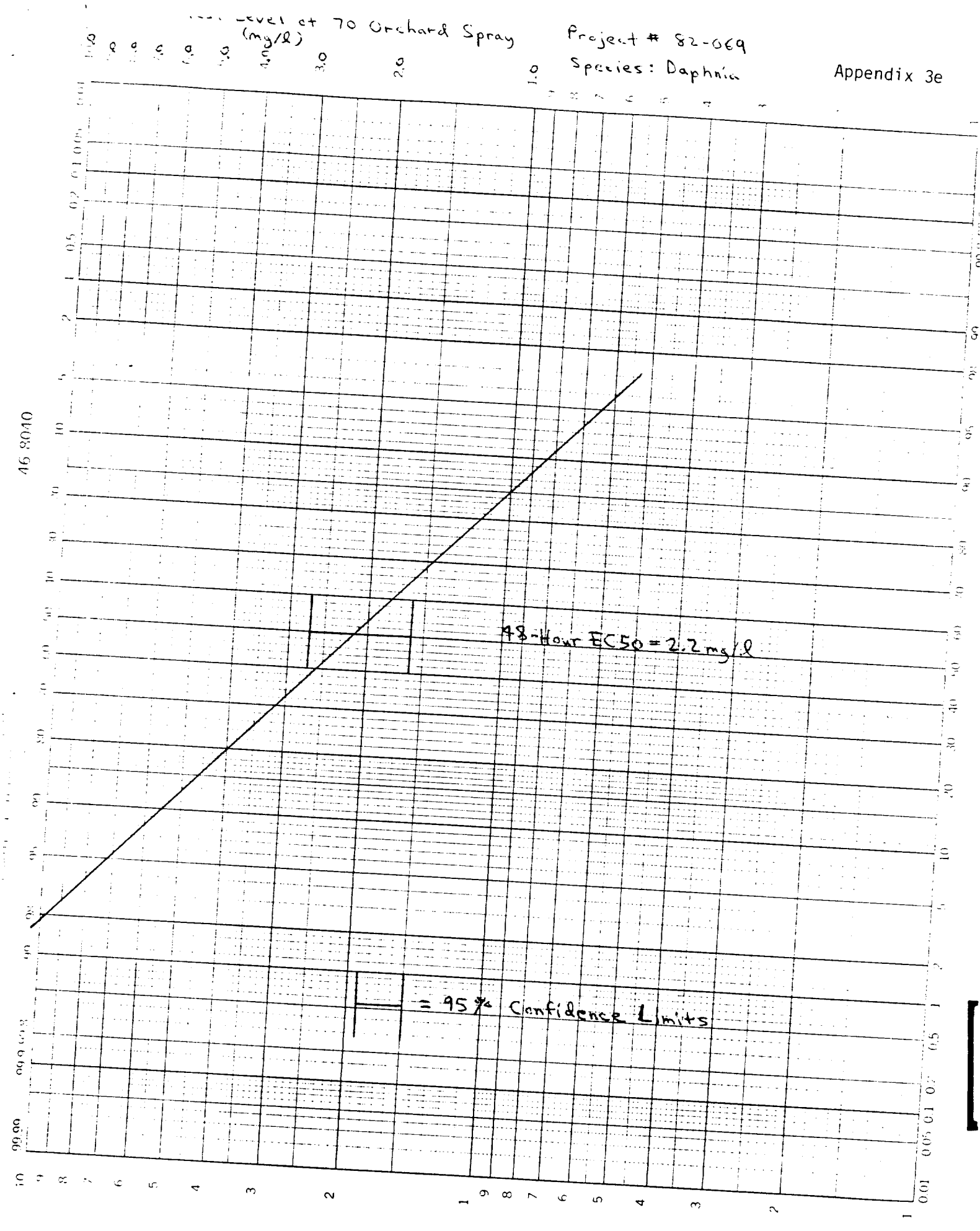
N' = 60

Exponent = $2.77/\sqrt{N'}$ = 0.36

$fEC_{50} = S^{(Exponent)}$ = 1.30

Upper Limit = $(EC_{50}) \times (fEC_{50})$ = 2.70 mg/l

Lower Limit = $(EC_{50}) / (fEC_{50})$ = 1.60 mg/l


Level at 70 Orchard Spray
(mg/l)
Project # 82-069
Species: Daphnia
Appendix 3e
48-Hour EC50 = 2.2 mg/l
= 95% Confidence Limits

APPENDIX 3f

48-HOUR AQUATIC TOXICITY STUDY IN DAPHNIA

Tabulation of the Number of Affected* Animals Found in Each Test Level

Test Substance	Nominal Test Concentration** (mg/l)	Duplicate	Cumulative Number of Affected* Animals at the Following Observation Intervals: 6-Hr	24-Hr	48-Hr	Dose Level Totals: Number Affected* / Number Tested	Percent Affected
Untreated Control	None	1	0	0	0		
		2	0	1	1	1/20	5%
Hexavalent Chromium (Positive Control)	0.10	1	0	0	0a		
		2	0	0	0	0/18	0%
	0.18	1	0	0	0a		
		2	0	0	3	3/18	17%
	0.32	1	0	0	10		
		2	0	0	8	17/20	90%
	0.56	1	0	2	10		
		2	0	1	10	20/20	100%
	1.00	1	0	7	10		
		2	0	8	10	20/20	100%

* Affected animals are daphnia that are either immobilized or dead.
**The nominal concentration is a theoretical amount of test substance required to achieve the desired test volume. This value assumes complete solubility of the test substance.

a Two animals were unaccounted for in this duplicate vessel during the observation interval.

Appendix 3g

CALCULATION SHEET FOR LITCHFIELD-WILCOXON EC_{50} DETERMINATION

Test Substance: Potassium Dichromate **Study Number:** 82-069

Test Title: 48 hour Aquatic Toxicity Study (24 hour Composite) **Species:** Daphnia magna

Observed and Expected Percent-Affected Table

Dose Level (mg/l)	Number of Organisms	Number of Affected Organisms	Observed Percent-Affected Organisms	Expected Percent-Affected Observed	Observed Minus Expected	Chi^2
0.1	20	0	0	—	—	
0.18	20	0	0	—	—	
0.32	20	0	0	0.01	0.01	0
0.56	20	3	15	9	6	0.045
1.00	20	15	~~95~~ 75 RE 11/9/82	80	5	0.015
						0.06

NOTE: The numbers in parenthesis are corrected values for 0 and 100 percent affected dose levels.

Calculation of Chi^2

K = 5 Total # of Organisms tested: ~~50~~ 100 (CC 11/9/82) Ave. # Organisms/Level: 20

Calculated Chi^2 = Total Chi^2 from Table times Average # of Organisms/Dose Level

= 20 x 0.06 = 1.2

Degrees of Freedom (N) = K-2 = 3

From Table 2, the Chi^2 for N degrees of freedom = 7.82

If the calculated Chi^2 is less than the tabular Chi^2 the line is a good fit.

Calculation of the 95% Confidence Limits of the EC_{50}

$$S = \frac{EC_{84}/EC_{50} + EC_{50}/EC_{16}}{2} = 1.30$$

N' = 20

Exponent = $2.77/\sqrt{N'}$ = 0.62

$fEC_{50} = S^{(Exponent)}$ = 1.18

Upper Limit = $(EC_{50}) \times (fEC_{50})$ = 0.94 mg/l

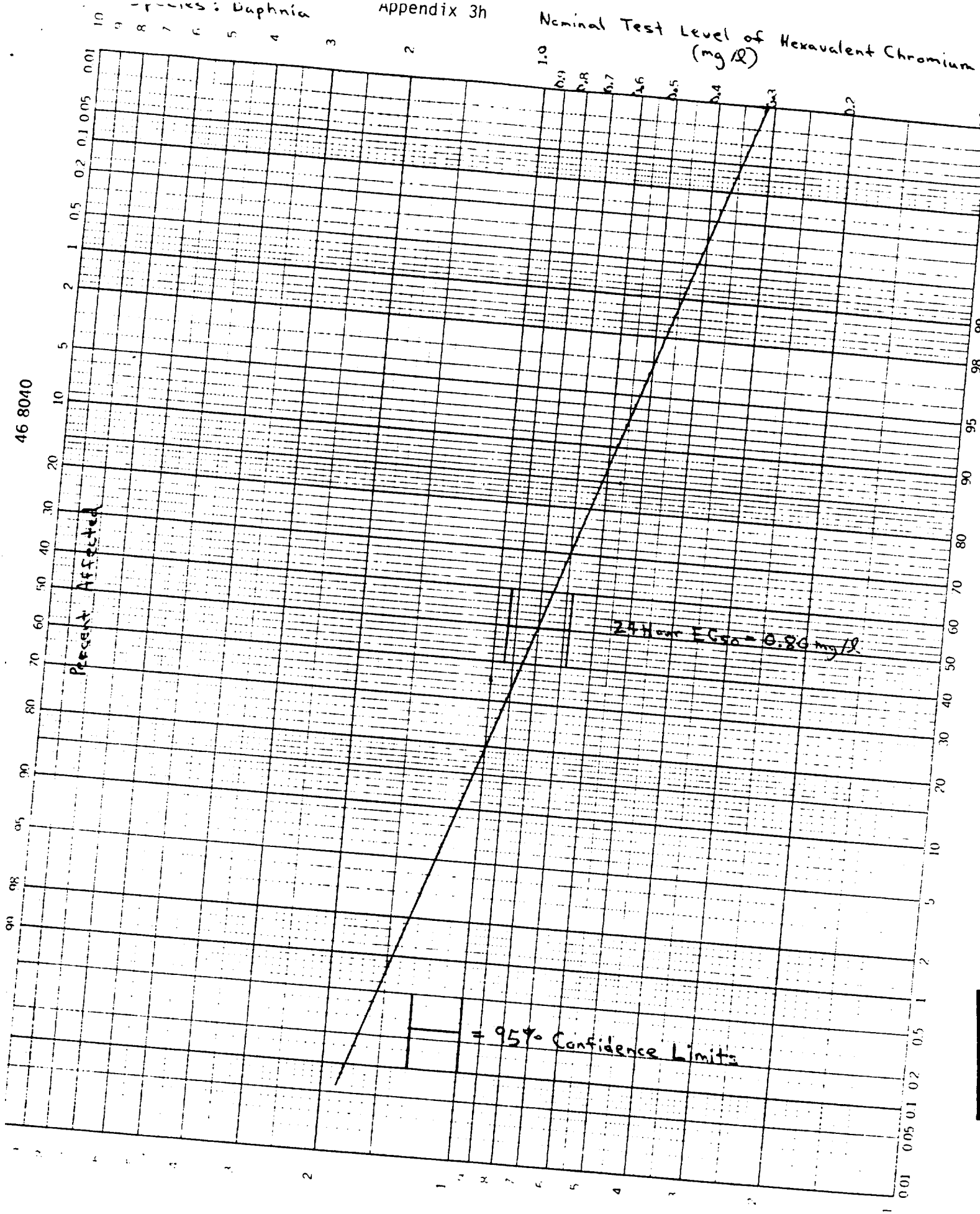
Lower Limit = $(EC_{50}) / (fEC_{50})$ = 0.68 mg/l

CC 11/9/82

Form # 07.0009 (7/82)

Species: Daphnia

Appendix 3h



CALCULATION SHEET FOR LITCHFIELD-WILCOXON EC_{50} DETERMINATION

Test Substance: Potassium Dichromate **Study Number:** 82-069

Test Title: 48 hour Aquatic Toxicity Study (48 hour composite) **Species:** Daphnia magna

Observed and Expected Percent-Affected Table

Dose Level (mg/l)	Number of Organisms	Number of Affected Organisms	Observed Percent-Affected Organisms	Expected Percent-Affected Observed	Observed Minus Expected	Chi^2
0.1	18	0	0	0.05	0.05	0
0.18	18	3	17	17	0	0
0.32	20	18	90	90	0	0
0.56	20	20	100	99.975	0.025	0
1.00	20	20	100	—		—
						0

NOTE: The numbers in parenthesis are corrected values for 0 and 100 percent affected dose levels.

Calculation of Chi^2

K = 5 Total # of Organisms tested: 98 Ave. # Organisms/Level: 19.6

Calculated Chi^2 = Total Chi^2 from Table times Average # of Organisms/Dose Level

= 19.6 x 0 = 0

Degrees of Freedom (N) = K-2 = 3

From Table 2, the Chi^2 for N degrees of freedom = 7.82

If the calculated Chi^2 is less than the tabular Chi^2 the line is a good fit.

Calculation of the 95% Confidence Limits of the EC_{50}

$$S = \frac{EC_{84}/EC_{50} + EC_{50}/EC_{16}}{2} = 1.29$$

N' = 18

Exponent = $2.77/\sqrt{N'}$ = 0.65

$fEC_{50} = S^{(Exponent)}$ = 1.18

Upper Limit = $(EC_{50}) \times (fEC_{50})$ = 0.27 mg/l

Lower Limit = $(EC_{50}) / (fEC_{50})$ = 0.19 mg/l

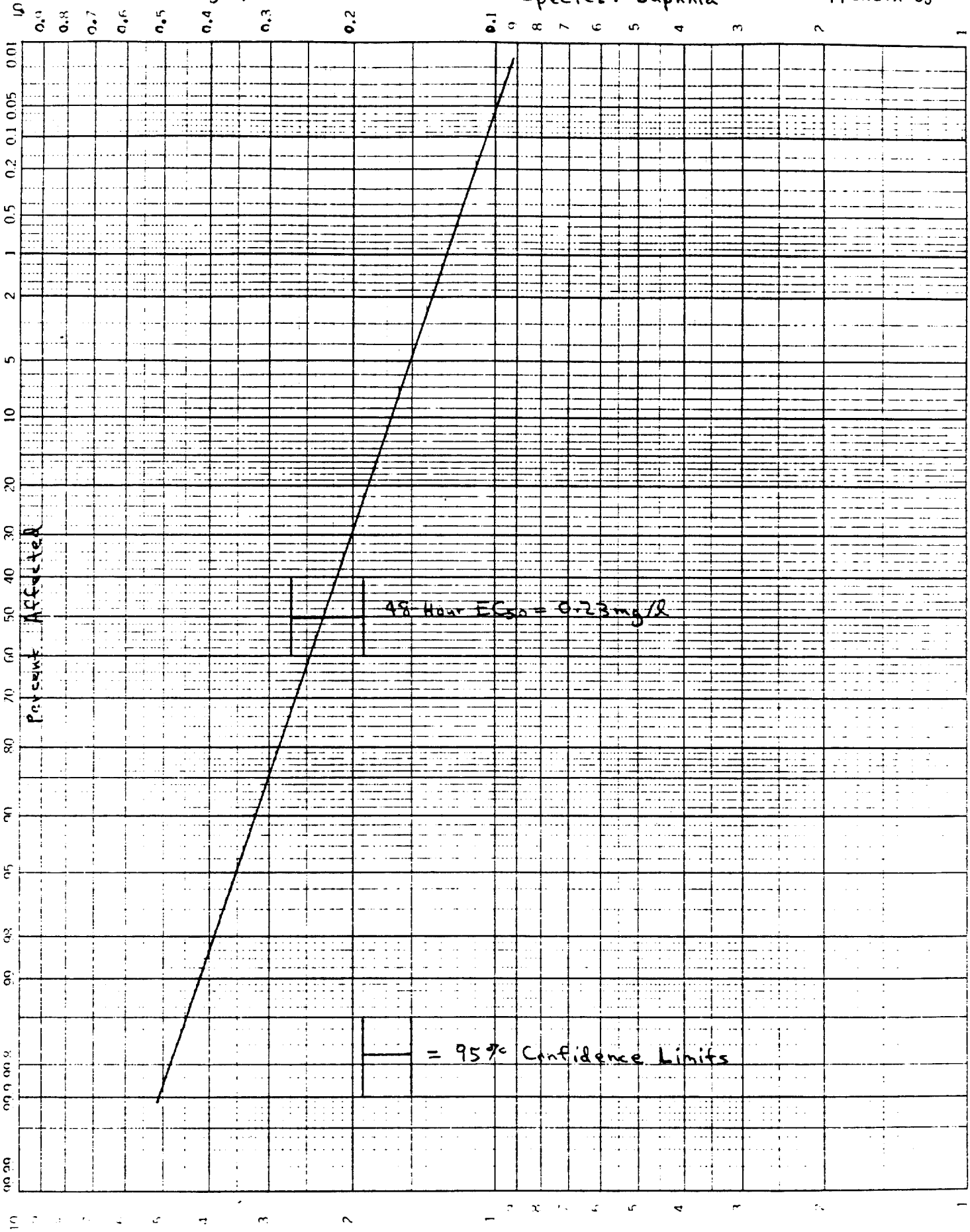
11/9/82

Nominal Test Level of Hexavalent Chromium (mg/l)

Project # 82-069

Species: Daphnia

Appendix 3j



46 8040

APPENDIX 4a

48-HOUR AQUATIC TOXICITY STUDY IN DAPHNIA

Mean Chemical Characteristics of the Test Water

Test Substance	Nominal Test Conc.* (mg/l)	Duplicate	Temperature (°C)	Dissolved Oxygen Conc. (mg/l)	Hydrogen Ion Conc. (pH)	Total Alkalinity (mg/l as $CaCO_3$)	Total Hardness (mg/l as $CaCO_3$)	Specific Conductance (umhos/cm)
Untreated Control	None	1	20.8	7.3	8.4	47	130	440
		2	20.8	7.6	8.5	48	135	435
70 Orchard Spray	1.0	1	20.5	7.3	8.3	48	145	430
		2	21.1	7.5	8.4	47	146	445
	1.8	1	20.5	7.5	8.4	46	146	435
		2	21.0	7.6	8.4	46	146	445
	3.2	1	20.7	7.5	8.3	46	146	440
		2	21.3	7.4	8.6	48	146	420
	5.6	1	20.9	7.8	8.6	47	147	435
		2	21.1	7.6	8.6	48	147	430
	10.0	1	21.3	7.8	8.4	48	147	425
		2	21.3	7.8	8.5	48	148	435

*The nominal concentration is a theoretical amount of test substance required to achieve the desired test level. This value assumes complete solubility of the test substance.

APPENDIX 4b

48-HOUR AQUATIC TOXICITY STUDY IN DAPHNIA

Mean Chemical Characteristics of the Test Water

Test Substance	Nominal Test Conc.* (mg/l)	Duplicate	Temperature (°C)	Dissolved Oxygen Conc. (mg/l)	Hydrogen Ion Conc. (pH)	Total Alkalinity (mg/l as $CaCO_3$)	Total Hardness (mg/l as $CaCO_3$)	Specific Conductance (umhos/cm)
Untreated Control	None	1	21.2	8.8	8.2	44	157	500
		2	21.0	8.8	8.3	44	157	545
Hexavalent Chromium (Positive Control)	0.10	1	20.2	8.9	8.4	44	157	500
		2	20.6	8.6	8.3	44	159	550
	0.18	1	20.4	8.9	8.4	44	157	540
		2	20.2	9.0	8.5	44	156	545
	0.32	1	20.1	8.9	8.3	43	157	550
		2	20.5	8.9	8.3	44	158	535
	0.56	1	20.3	8.9	8.2	44	155	555
		2	20.4	8.9	8.3	43	156	545
	1.00	1	20.0	8.9	8.3	43	155	540
		2	20.3	8.8	8.2	44	156	540

*The nominal concentration is a theoretical amount of test substance required to achieve the desired test level. This value assumes complete solubility of the test substance.

APPENDIX 5

48-HOUR AQUATIC TOXICITY STUDY IN DAPHNIA

Analytical Chemistry Results

Positive Control: Hexavalent Chromium

Nominal Test Concentration (mg/l)	Mean Analytically Determined Test Concentration (mg/l)
Untreated Control (None)	0.00
0.10	0.11
0.18	0.18
0.32	0.30
0.56	0.54
1.00	0.93
Stock Solution 10.0	10.0

QUALITY ASSURANCE SECTION FINAL REPORT STATEMENT

Gulf Project Number 82-069

Study Title 48-Hour Aquatic Toxicity Study

(70 Orchard Spray)

The Quality Assurance Section has conducted the inspections listed below on this study. The inspections are a part of an on-going program outlined by the Environmental Protection Agency's Good Laboratory Practice Regulations 772.110-1 (c)(4)(ii)(G) and 772.110-1 (J)(1)(i)(N), and the Quality Assurance Section's Standard Operating Procedures. In accordance with these regulations and procedures, Inspection Summaries were submitted to the Study Director and the Toxicology Department's Management.

Date of Inspection	Type of Inspection	Date of Submission of the Inspection Summaries	
8/12/83	Protocol Review	Study Director	8/13/83
		Management	9/ 9/83
----	Monitor	Study Director	----
		Management	----

NOTE: An audit of this study report was not conducted. In accordance with a Toxicology Department managerial decision, only selected study reports are being audited.

Prepared by Richard M. Siconolfi Date 6-1-83

Reviewed by _____ Date _____

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

Dennis R. Jonke
Manager, Health, Safety and Environmental Quality
BP Oil, Inc.
BP Oil Company
200 Public Square
Cleveland, Ohio 44114-2375

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

DEC 27 1994

EPA acknowledges the receipt of information submitted by your organization under Section 8(e) of the Toxic Substances Control Act (TSCA). For your reference, copies of the first page(s) of your submission(s) are enclosed and display the TSCA §8(e) Document Control Number (e.g., 8EHQ-00-0000) assigned by EPA to your submission(s). Please cite the assigned 8(e) number when submitting follow-up or supplemental information and refer to the reverse side of this page for "EPA Information Requests".

All TSCA 8(e) submissions are placed in the public files unless confidentiality is claimed according to the procedures outlined in Part X of EPA's TSCA §8(e) policy statement (43 FR 11110, March 16, 1978). Confidential submissions received pursuant to the TSCA §8(e) Compliance Audit Program (CAP) should already contain information supporting confidentiality claims. This information is required and should be submitted if not done so previously. To substantiate claims, submit responses to the questions in the enclosure "Support Information for Confidentiality Claims". This same enclosure is used to support confidentiality claims for non-CAP submissions.

Please address any further correspondence with the Agency related to this TSCA 8(e) submission to:

Document Processing Center (7407)
Attn: TSCA Section 8(e) Coordinator
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
Washington, D.C. 20460-0001

EPA looks forward to continued cooperation with your organization in its ongoing efforts to evaluate and manage potential risks posed by chemicals to health and the environment.

Sincerely,

Terry R. O'Bryan

Terry R. O'Bryan
Risk Analysis Branch

Enclosure

12864 A

Triage of 8(e) Submissions

Date sent to triage: AUG 2 4 1985

NON-CAP CAP

Submission number: 12664A

TSCA Inventory: Y N D

Study type (circle appropriate):

Group 1 - Dick Clements (1 copy total)

ECO AQUATO

Group 2 - Ernie Falke (1 copy total)

ATOX SBTOX SEN w/NEUR

Group 3 - Elizabeth Margosches (1 copy each)

STOX CTOX EPI RTOX GTOX

STOX/ONCO CTOX/ONCO IMMUNO CYTO NEUR

Other (FATE, EXPO, MET, etc.): _____

Notes:

THIS IS THE ORIGINAL 8(e) SUBMISSION; PLEASE REFILE AFTER TRIAGE DATABASE ENTRY

Comments not found
Please evaluate

For Contractor Use Only

entire document: 0 1 2 **pages** 1,2 **pages** 1,2,3,TABS

Notes:

Contractor reviewer : PR **Date:** 11/21/94

CECATS\TRIAGE TRACKING DBASE ENTRY FORM

CECATS DATA:
Submission # 8EHQ- 0892-12864 SEQ. A

TYPE: (INT) SUPP FLWP

SUBMITTER NAME: BP Oil Company

INFORMATION REQUESTED: FLWP DATE:
0501 NO INFO REQUESTED
0502 INFO REQUESTED (TECH)
0503 INFO REQUESTED (VOL ACTIONS)
0504 INFO REQUESTED (REPORTING RATIONALE)

DISPOSITION:
(0639) REFER TO CHEMICAL SCREENING
(0678) CAP NOTICE

VOLUNTARY ACTIONS:
(0401) NO ACTION REPORTED
0402 STUDIES PLANNED/UNDERWAY
0403 NOTIFICATION OF WORKERS/OTHERS
0404 LABEL/MSDS CHANGES
0405 PROCESS/HANDLING CHANGES
0406 APP./USE DISCONTINUED
0407 PRODUCTION DISCONTINUED
040. CONFIDENTIAL

SUB. DATE: 08/25/92 OTS DATE: 08/28/92 CSRAD DATE: 09/29/94

CHEMICAL NAME: 70 Orchard Spray

CAS# 64742-55-8

INFORMATION TYPE:		P F C
0201	ONCO (HUMAN)	01 02 04
0202	ONCO (ANIMAL)	01 02 04
0203	CELL TRANS (IN VITRO)	01 02 04
0204	MUTA (IN VITRO)	01 02 04
0205	MUTA (IN VIVO)	01 02 04
0206	REPRO/TERATO (HUMAN)	01 02 04
0207	REPRO/TERATO (ANIMAL)	01 02 04
0208	NEURO (HUMAN)	01 02 04
0209	NEURO (ANIMAL)	01 02 04
0210	ACUTE TOX. (HUMAN)	01 02 04
0211	CHR. TOX. (HUMAN)	01 02 04
0212	ACUTE TOX. (ANIMAL)	01 02 04
0213	SUB ACUTE TOX (ANIMAL)	01 02 04
0214	SUB CHRONIC TOX (ANIMAL)	01 02 04
0215	CHRONIC TOX (ANIMAL)	01 02 04

INFORMATION TYPE:		P F C
0216	EPI/CLIN	01 02 04
0217	HUMAN EXPOS (PROD CONTAM)	01 02 04
0218	HUMAN EXPOS (ACCIDENTAL)	01 02 04
0219	HUMAN EXPOS (MONITORING)	01 02 04
(0220)	ECO/AQUA TOX	01 02 04
0221	ENV. OCCC/REL/FATE	01 02 04
0222	EMER INCI OF ENV CONTAM	01 02 04
0223	RESPONSE REQEST DELAY	01 02 04
(0224)	PROD/COMP/CHEM ID	01 02 04
0225	REPORTING RATIONALE	01 02 04
0226	CONFIDENTIAL	01 02 04
0227	ALLERG (HUMAN)	01 02 04
0228	ALLERG (ANIMAL)	01 02 04
0239	METAB/PHARMACO (ANIMAL)	01 02 04
0240	METAB/PHARMACO (HUMAN)	01 02 04

INFORMATION TYPE:		P F C
0241	IMMUNO (ANIMAL)	01 02 04
0242	IMMUNO (HUMAN)	01 02 04
(0243)	CHEM/PHYS PROP	01 02 04
0244	CLASTO (IN VITRO)	01 02 04
0245	CLASTO (ANIMAL)	01 02 04
0246	CLASTO (HUMAN)	01 02 04
0247	DNA DAM/REPAIR	01 02 04
0248	PROD/USE/PROC	01 02 04
0251	MSDS	01 02 04
0299	OTHER	01 02 04

TRIAGE DATA:

NON-CBI INVENTORY: (YES) / NO / DETERMINE

CAS SR

ONGOING REVIEW: YES (DROP/REFER) / NO (CONTINUE) / REFER:

SPECIES: Daphnia Magna

TOXICOLOGICAL CONCERN: LOW / MED / HIGH

USE:

PRODUCTION:

COMMENTS:

ENTRY FORM

CAPNUM	LTR	DATE	CBI	CASNO	CONCERN	AI
12864	a	0892		64742558	MODERA	NS

SOLUBILITY
soluble .

CHEMNAME
70 Orchard spray, flow-through

PHYSTATE
liquid

ORGANISM	DURATION	ENDPOINT	CODE	TOXVALUE	UNITS
Water flea, Daphnia magna	48h	EC50		2.2	mg/l

MELTINGPT
NS

COMMENTS
24h EC50=2.9mg/l
nominal conc